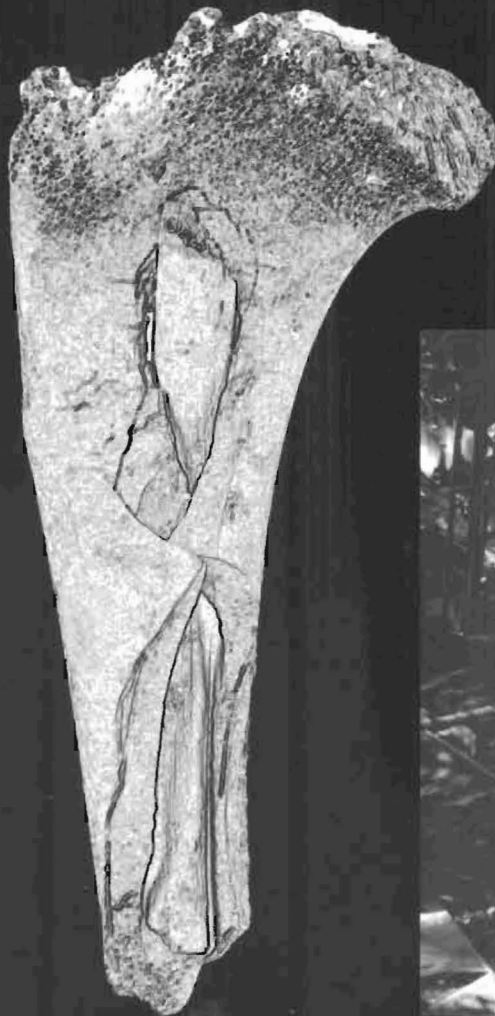




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Consuming passions and patterns of consumption

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Chapter 2

Cooking in Zooarchaeology: Is This Issue Still Raw?

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Feeding practices, including food processing and cooking, are some of the most fundamental activities in creating and maintaining social life. Despite their crucial character, traditionally they have not been considered in archaeological studies. In this paper I will emphasize why it is necessary for archaeology in general, and for zooarchaeology in particular, to call attention to this sphere of practices.

Traditionally, Western thought has considered societies to be divided into two main spheres of production: the domestic sphere and the public sphere. Different analyses have already denounced the artificiality of this division and how the sphere of the domestic — associated with women and considered non-fundamental in the configuration of social processes — has been banished from most social studies (Oakley 1974; Yanagisako 1979; Rosaldo 1980; Cowan 1989; Wylie 1992; Hendon 1996). Indeed, the traditional study of social processes has emphasized change and therefore left unconsidered the activities belonging to the domestic sphere, since they have been thought to be natural, routine and unchangeable. If one desires to take an alternative approach, there are even epistemic difficulties in the naming of this sphere of practices. In fact, this lack of vocabulary in language is symptomatic of a more general problem: the lack of fit between women's experiences and the frameworks of thought available for understanding experience in general (De Vault 1991). We have chosen the term 'maintenance activities' (Picazo 1997) to refer to these set of practices, since it directly appeals to the importance of women's work in continually generating the social matrix of life.¹

Feeding and cooking as a foreground to social dynamics

What needs to be stressed is how fundamental and central maintenance activities are putting in place most basic social relations, how the decisions taken

in this sphere of practice can affect many other realms of activities, and how other practices can only be developed when sustained by maintenance activities. Feeding, and food processing and cooking as integral parts of it, is a good example. An event that occurred while on a trip through Senegal illustrates some of these aspects. When visiting some villages in the Southwest of Senegal, I was told that the divorce rate was increasing in some communities. For their daily subsistence, these communities rely on a well-known dish called *cous-cous*, which is prepared by women. A change in the economic conditions of the country had led many families to a lower acquisitive level. As a result, many husbands were not able to buy wheat to prepare this dish any longer. Instead, they would replace it with the traditional and also cheaper *mill*. The disadvantages of this new staple are huge, however, since it requires a tremendous investment of labour to process it. As a result, women were no longer able to allocate their time to many of their previous activities. Once this became clear to the women, many of them left their marital dwellings and returned to their family homes, producing a temporal readjustment in the communities' sets of social relations.

Despite their clear significance as a structuring principle of social life, food processing and cooking have been considered inconsequential in most academic discourses. Stemming from the Greek tradition, an important branch in philosophy has praised fasting. As Lupton (1996, 2) points out 'not only were everyday practices such as eating and food preparation regarded as being beneath philosophical study, they threatened pure thought by encouraging philosopher's bodily needs to disrupt and disturb their cogitations'. Fasting has been associated with the masculine and the rational, while cooking and its dimensions with the feminine and the emotional. Probably because of this, cooking and food have remained as important issues in domains

such as painting, literature, cinema, even psychoanalysis, where emotions and sensations have not been 'obliterated' (see, for example, Esquivel 1998; Mahoney & Yngvesson 1992).

Food and raw resources, however, have also been central issues in some academic disciplines. Nutrition is probably the clearest example, although with a unique stress on the biological dimensions of food and some cooking practices (Blaxter & Waterlow 1985; Linder 1985; Stinson 1992). The social discourses around food have been mainly developed in Sociology and Anthropology, but even here food processing and specifically cooking practices have drawn less attention than other aspects in the world of food. Anthropological reports describe, many times in detail, cooking events performed in ritual festivals. There are fewer accounts, however, detailing everyday-life cooking practices (see also Lévi-Strauss 1965 on this point), and even fewer have considered the implications which food processing may have as a foreground to social dynamics (a clear exception is the attention given to cooking as a way to understanding social life and historical processes in the analysis undertaken by Weismantel 1994). Cooking has usually been seen as a dependent variable of other aspects: the ecological context (Harris 1985), what has been called 'food' production and food consumption. As Goody (1994, 43) states, cooking is 'the end point of that major activity of humankind (reproduction apart), that is, the production of food'. But cooking is many times more than a final process in a chain; as shown below, it can also be at the forefront of this chain, serving as an impetus to drive the very system of production.

Most approaches have analyzed food and cooking from the perspective of consumption. They have emphasized the importance of food as a way to express and construct social behaviour patterns, norms or religious prohibitions, cultural and symbolical meanings (Crawley 1902; Frazer 1907; Fortes & Fortes 1936; Firth 1966; Young 1971; Douglas 1971; 1975; Arnott 1975; Khare 1976; Sahlins 1976; Barthes 1979; Turner 1982; Bourdieu 1984; Mintz 1985; Visser 1986; Weismantel 1994). In recent years, and connected to the contemporary concern with the body and health, the sociology of food and eating have received renewed attention and the interaction between food, embodiment and subjectivity has been investigated (Fischler 1988; Curtin 1992; Falk 1994; Lupton 1996). The cultural and subjective values of food, which pass into the subject through its possession and consumption, have again been emphasized. Consumption is, once more, the aspect more em-

phatically considered, but the importance of cooking processes as a way to embodiment has also been acknowledged (see, for instance, Falk 1994).

From a structuralist perspective, cooking has also been seen as a fundamental social component. For Lévi-Strauss (1958; 1965) cooking systems express cosmologic and sociologic oppositions of human societies and are central to understanding them. The structures of a society can be found here, as it is possible to find them in the kinship system, in mythology, and in political ideology among others. However, because of his own theoretical framework, the relationships among the different systems expressing structures in society are not investigated. In fact, it was not until the emergence of Feminism in certain disciplines of the social sciences that the various activities associated with the 'domestic' began to receive the attention that they deserved. In the wake of feminism, different scholars in History, Economy, Sociology and Anthropology considered housework important, and food processing and cooking practices began to be analyzed (Oakley 1974; Cowan 1989; De Vault 1991).

Cooking as a maintenance activity in archaeology

Archaeology has remained quite ignorant of the contributions made by the aforementioned research, even when elements employed or resulting from food-processing are the most common ones (hearths, cooking pottery, grinding stones, animal bones). Only Gender Archaeology, in dealing with the spheres of women's experiences (Conkey & Gero 1991) and introducing the feminist interest on housework — mainly in household studies (Hendon 1996) — has begun to see cooking as a fundamental realm to be analyzed. Brumfiel (1991), for example, brought to light how cooking activities were central in the transition from pre-Aztec to Aztec society in Central Mexico. During this transition there was a fundamental change in cooking — from wet to dry food — that made feasible important changes in labour patterns demanded by Aztec domination. This is thus a good example of how social changes are supported by maintenance activities.

Feeding is a complex social phenomenon and implies different levels of action and relationships among food preparers/givers, and between food-preparers/givers and food-consumers/receivers. From a technical point of view, food-preparers are engaged in three main types of actions (see also Colomer & Montón 1997):

- a) The first of these refers to food processing and involves all those activities related to the trans-

formation of vegetal and animal resources into food, into edible products that will be used in the short- or long-term. These activities include cooking processes (boiling, frying, roasting, steaming, smoking, etc.) as well as other tasks that transform raw products without using heat (flour procurement, fermented and salted products, etc.). Literally, the term food has been defined as any substance that can be taken into the body of an animal or plant to maintain its life and growth. In the case of humans, this aim is mainly accomplished through the mediation of maintenance activities, through food processing. The term food has, therefore, a social meaning since these substances are only converted into food when they are filtered by the work of maintenance activities in a cultural process.

- b) Essential requirements to the conversion of raw resources into food are the procurement of water and fuel, which therefore constitute an important aspect in the process of feeding. Though their properties are not always incorporated to food, they are usually essential to metamorphose raw products into food. The quantity and quality of water and fuel required influence the daily organization of maintenance activities.
- c) Finally, it is also important to maintain the artefacts (pots, knives, grinding stones, ovens, etc.) and spaces (hearths, storage facilities, waste areas, etc.) needed for these activities. Although the time allocated to maintaining artefacts and spaces is variable and culturally patterned, cleaning activities are always crucial to a community's salubrity and have consequences in the spatial planning of settlements and houses.

Food processing and cooking, as feeding activities, constitute a form of labour that embraces specific kinds of relationships both because of the particular nature of the labour required and probably because of the agents performing these activities. Food processing and cooking have traditionally been a part of women's knowledge, which has been handed down by women to women. As with other occupations, they also have a period of apprenticeship. Learning relationships are fundamental in becoming a cook and to the successful development and continuity of the technological process. It is necessary to know some of the properties of the raw resources, how tools and facilities in use are to be employed, the different steps involved in each one of the cooking systems, the cooking time, the temperature conditions, fuel suitability, maintenance of the energy source, etc. Through cooking the nature

of raw resources change improving their characteristics to human consumption: palatability and digestibility is improved, toxic and bacterial elements disappear and preservation is accomplished (Leopold & Ardrey 1972; Stahl 1984; Linder 1985; Wandsnider 1997). Cooking may change the nutrients of raw resources by increasing their nutritious value, or decreasing or losing it. It is therefore crucial to acquire a good knowledge of these processes. On the other hand, through cooking processes the desirability (social or personal) of food is also accomplished.

Despite its importance, food-processing technology has seldom been acknowledged as a social technological system to be analyzed (exceptions are, for example, Firth 1966; Bruneton 1975; Goody 1994; Colomer 1996). Academic attention has focused on the technology of the activities that procure raw resources such as hunting practises, agricultural methods, etc. (see Oswalt 1976 as an example of this). In a similar manner, technological changes experienced in food processing, while directly affecting the working time of an important part of the population, have been ignored (Cowan 1989). I myself had the opportunity to discover, in a recent conversation with a friend from Calcutta, how important the introduction of the stove was for Indian women living in rural areas. The overlooking of this issue is probably related to the fact that cooking is associated in most societies with women's work and therefore included in the economic sphere of the 'domestic'. Indeed, cooking (as a maintenance activity and a part-time job) is probably one of the activities most consistently performed by women. In practically all known societies (present and past), there is a strong identification between women and cooking. Although men assist in some cases and participate in the preparation of ritual meals, the responsibility of the process relies on women as is shown by countless examples (Brumfiel 1991; Moore 1986; Friedl 1975; Fruzzetti 1985; De Vault 1991; Warde & Hetherington 1994; Goody 1994; Lupton 1996, to name a few). I do not think it is a coincidence that precisely these ritual meals have drawn more attention in academic studies, as it is not a coincidence that the aspects emphasized by ethnoarchaeology and zooarchaeology in the analysis of food processing have been those related to butchery practices conducted or supposedly conducted by men (see below).

Cooking and zooarchaeology

Animal bones are among the most common remains in archaeological excavations. Most of them are the

result of social practices carried out by humans and, basically, most are cooking remains discarded after consumption. But zooarchaeology has been affected by the same biases as other disciplines in the Social Sciences in relation to 'domestic' activities. Broadly speaking, academic discussion in zooarchaeology has been focused on three main sections: a) aspects related specifically with the identification and quantification of the animals present in the archaeological sample; b) with the procurement and management of these animals; and c) with the formation of the bone archaeological record. Cooking, as shown below, may affect the three of them, but its presence and consequences have rarely been estimated. During the last few years, however, and though the contributions are still scarce, some studies have drawn attention to the cooking domain as an important topic to be considered (Gifford-González 1989; 1993; Oliver 1993; Pearce & Luff 1994; Montón 1996). Indeed, there are some issues in zooarchaeology which are given a new twist when analyzed under a cooking perspective.

One of the most debated subjects in prehistory is when fire was first controlled by humans and when it was first applied to the transformation of raw resources (Gowlett *et al.* 1981; Isaac 1984; Clark & Harris 1985; James 1989). So, one of the most intriguing questions facing prehistorians is 'when did cooking first appear?'. The emergence of cooking must have had important consequences to humankind. Although controversial, the possibility that cooking influenced anatomical changes in hominid evolution during the Middle Pleistocene needs further research (James 1989; Wandsnider 1997). What does stand without a doubt is that the application of heat produced an enrichment of the diet by providing many more products that were not previously edible (Leopold & Ardrey 1972). In the case of animals, cooking (roasting first and boiling later on) allowed humans to take advantage of some animal parts that, otherwise, would have had less or no nutritional value. In addition to the dietetic improvements, the appearance of cooking practises would have probably opened a new field to express and construct new networks of social relations and values (as it is demonstrated by the manifold meanings and relations associated with food and cooking in present and past societies (Frazer 1907; Pullar 1970; Barthes 1979; Revel 1979; Bahloul 1983; Visser 1986; Curtin 1992; Goody 1994; Weismantel 1994). The emergence of cooking, therefore, should be an important subject for archaeology and history. To zooarchaeologists, this question deserves special at-

tion since the management of animal carcasses must have been deeply affected by the introduction of cooking. Present ethnographic observations have demonstrated how cooking is a key point in understanding patterns of transport and processing of hunted animals (Binford 1978; Gifford-González 1989; 1993; Oliver 1993):

How an animal is disjointed and filleted depends on whether a butcher aims to produce joints of meat to roast on a fire, segments of bones and flesh to boil in a pot, boneless cuts to be sliced and dried as jerky, or manageable and quickly frozen segments for winter storage (Gifford-González 1993, 185).

and they have also led to suggestions on the evolution of animal carcasses management:

the importance of cooking in structuring initial butchery and transport decisions suggests that prehistoric innovations in nutrient extraction technologies (e.g., fire, roasting, pits, stone boiling, and ceramic boiling vessels) may have driven the evolution of carcass transport and processing strategies. (Oliver 1993, 222)

So, it seems irrefutable that cooking produced important changes in human daily-life, but it is still unclear when cooking first emerged. A better understanding of how heat in cooking processes affects bones could help in the clarification of this problem. More experimentation on these aspects could contribute to the interpretation of the contexts where the presence of controlled fires is ambiguous. I wholeheartedly agree with the necessity of ethnoarchaeological observation (Gifford-González 1993; Oliver 1993) but archaeological experimentation also has to be encouraged in order to know how different systems of cooking affect bones.

Cooking indexes on bones

There are not many experiments conducted in archaeology that attempt to understand how cooking alters bones. As previously stated (Martínez 1995), the study of bone modifications by humans has a long tradition in zooarchaeology (Martin 1907-10). Recently, the interest in this taphonomic area has been renewed (e.g. Bonnicksen & Sorg 1989; Stiner 1991; Hudson 1993; Lyman 1994). By far the largest segment of research has focused on the processes of skinning, carcass disarticulation, defleshing, periostium and tendon removal and marrow extraction. These processes have seldom been connected with cooking practices and the alterations that bones suffer in the different cooking processes have not received, by any means, the same interest. Although

there is an acknowledgement that different cooking methods affect bones in different ways (Colley 1990), taphonomic analyses have seldom considered cooking as an important taphonomic agent.

Different experiments have analyzed the effects that heat has on bones. With few exceptions (Pearce & Luff 1994), however, many of these experiments have been conducted with goals other than the evaluation of cooking activities (Herrmann 1977; Shipman *et al.* 1984; Von Endt & Ortner 1984; Buikstra & Swegle 1989), since the way heat affects bones is also of interest to other disciplines such as physical anthropology.

In the wake of these studies we know that heating usually changes the colour, surface texture, microscopic morphology, and crystalline structure of bones; that weight and size of bones may decrease and that breakage and deformation may be affected. Not all these changes, however, are important to cooking, since some of them only occur at temperatures higher than the ones bones reach at normal cooking temperatures. Bones begin to shrink at 750°C; the main changes in crystalline structure are produced between 525 and 645°C; changes in microscopic morphology, one of the most reliable indicators to reveal which temperatures the bones have been subjected to, begins at 185°C (Shipman *et al.* 1984).

In other cases, changes experienced by bones in cooking are only context-specific and so, it is impossible to extract indexes that can always be applied. The experiment conducted by Pearce & Luff (1994) was aimed at seeing differences in fresh, boiled and roasted bones. They could see that, according to the methods used and, in the case of roasted bones, as a function of cooking temperatures and time length, the colour and texture of bones were different. It seems clear, as pointed out by Pearce & Luff (1994) and Shipman *et al.* (1984), that colour is not a good indicator for showing at what temperature the bones were affected. The changes in surface colour, however, specifically when combined with texture surface, should be examined more in relation to the cooking system used.

Although the effects of cooking methods in relation to bone fragmentation, breakage and deformation also need further investigation, current research shows some differences between fresh, boiled and roasted bones. Pearce & Luff (1994) saw that boiled bones tend to split longitudinally, the length of boiling time being an influential factor. On the other hand, roasted bones fragmented more and their friability increased with temperature. Some eth-

nographic observations seem to point in the same direction. While he was among the Hadza, Oliver (1993) noticed different patterns of bone breakage between fresh bones and roasted bones. Gifford-González (1993), considering other experiments (Bonar & Glimcher 1970; Richter 1986; Sedlin 1965), noticed that the loss of collagen in cooked bones can possibly produce different breakage patterns. But what seems clear is that, as previously mentioned, different cooking and processing methods (boiling, roasting, brining, smoking, etc.) influence the way animals are butchered. In a study of the Roman sites in Lincoln, Dobney *et al.* (1996) interpreted cattle scapulae with trimmed glenoid cavities and chopped spinae as trimmed and cold-smoked joints.

The experiments conducted up to now are promising. They themselves, though, demonstrate the necessity to conduct further research. Besides, it is necessary to bear in mind that it would be important to detect not only if the bones have been cooked or not but which method has been employed. At the present state of research it is almost impossible to interpret faunal samples from this perspective. Only few bones in archaeological samples show at first sight evidence of having been cooked (e.g. Coy 1975). Moreover, in many cases, post-depositional processes have affected bones in such a way that it is impossible to see human alterations on bone surfaces. It would be important, therefore, to discern how cooking processes change bone structure. New experimentation should also overcome some of the current problems. Experiments should be carried out with larger samples and with fleshed and defleshed bones from different species. We have to bear in mind that most of the cooking processes are done with fleshed bones, which can modify the effects of heat on the bones (Van Wijngaarden-Bakker 1985). It would also be important to determine whether other post-depositional factors may affect the bone in a similar way (Spennemann & Colley 1989; Lyman 1994).

Thus, experiments with the aim of identifying cooking processes are still needed as well as ethno-archaeological observations which are sensitive to these issues. As Oliver points out, 'we do not know how different elements are cooked, which bones are broken prior to cooking, whether roasting or boiling of bone creates visible damages, how cooking- and consumption-related bone breakage varies by element, taxon, and cooking technique' (1993, 201).

Cooking as a taphonomic agent

As already mentioned, cooking has seldom been con-

sidered as an important taphonomic agent. The scarce information available at present, however, leads to the conclusion that ignorance of this aspect can seriously distort the evaluation of our faunal archaeological samples.

One of the primary concerns in zooarchaeology has been the quantification of faunal remains and different indexes have been aiming to achieve this goal. Among them, the weight of bone per taxon is still used by many zooarchaeologists in order to give meat weights and make comparisons among the species in the record (see Casteel 1978 and Vigne 1991 for a discussion on weight methods). Bearing in mind other existing criticisms, the effects that cooking has on bones may render this method problematic because bones lose weight while being cooked. Although more experimentation is needed, the results after Pearce & Luff (1994) indicate differences in the percentage of weight lost with roasting and boiling methods. Whilst boiled bones always lost the same proportion of weight, roasted bones lost more weight in relation to cooking temperature. Cooking methods also have to be considered when using other indexes such as the number of identified specimens. Since cooking methods affect both post-cooking fragmentation and pre-cooking butchery, archaeological representation may be biased against some animals.

Differential preservation is another important aspect in the evaluation of faunal samples. Cooking needs to be added to the other factors that influence bone preservation. According to the cooking method employed, bone characteristics are different, making it more favourable to preservation and more or less attractive to the action of other taphonomic agents such as dogs. It has been noted that roasted, smoked and burnt bones are better preserved than boiled bones (Pearce & Luff 1994; Van Wijngaarden-Bakker 1985). Buikstra & Swegle (1989), however, mention that this is not always the case and that the preservation of burnt bones depends on the characteristics of the sites.

In discussing taphonomic questions, we also cannot forget the problem of intrusive animals in the archaeological record. At some sites for example, it may be impossible to distinguish whether animals such as rabbits were consumed or not. Cutmarks may inform us on this aspect, but many times they are absent. Facing the impossibility of discerning whether these animals are contemporaneous with the rest of the record, they are often excluded from economic evaluations. More inspection of the marks left by cooking on bones could be useful to resolve such problems.

Discussion

In this paper I have stressed two important aspects in the evaluation of food-processing practices. On the one hand, food processing — as an integral part of maintenance activities — is fundamental in generating and sustaining social life. On the other hand, and as a social practice, the evaluation of food processing affects key discussion areas in zooarchaeology such as the quantification of bone remains, the management of animal resources and the very formation of the archaeological record.

We have briefly seen how important the development of cooking practices must have been to humankind and how cooking has sustained changes throughout historical periods. But the study of food processing and cooking is also important for the interpretation of daily life, since its practice permeates the whole social net and it is crucial to the entire community life. It is not only technological processes that make raw resources edible. Through the work of social agents, cooking transforms raw resources into food in a cultural process, that also confers cultural values to food and the people who consume it. Cooking, therefore, is not only a technological process to make raw resources edible but 'a moral process, transferring raw matter from "nature" to the state of "culture", and thereby taming and domesticating it' (Lupton 1996, 2). In this process, networks of personal relationships are created and social features expressed and constructed. The politics of cooking have already been noted, with special stress in the definition and creation of identity and difference (individual and collective). In this sense, cooking has generated and expressed ethnic and nationalistic feelings, gender, class, and so on. (Barthes 1979; Bahloul 1983; Bourdieu 1984; 1985; Mintz 1985; Klopfer 1993; Weismantel 1994; Zubaida & Tapper 1994; Jansen 1997).

In spite of their evident pre-eminence, food-processing, and most clearly cooking, have assumed a low level of importance in archaeological discourse. Up to now, stress has been put on how resources are procured and how they are eaten. How they are prepared to be eaten is also of paramount importance. Cooking has spatial and material requirements that are involved in the organization of the settlements (from the selection of the very place to settle to the allocation of food-processing areas or the disposal of waste material). Cooking is also a key point in directing other practises among communities and in understanding changes that are produced in other spheres. The way food is prepared is culturally pat-

terned and can have a cultural meaning when patterns are detected in the archaeological record. Thus, cooking and changes in the way food is cooked is socially and culturally informative.

Finally, I would like to stress the necessity of choosing new subject areas. Subject-areas that exhibit a focus on the interests and activities of women. It is not only that those activities, like food processing and cooking, traditionally considered part and parcel of women's domain have to be included; what is important is to demonstrate how central these activities are in any explanation of the past. In doing this, we shall begin to deal with new kind of relationships, such as the ones defining food processing and cooking and maintenance activities in general. It is well-known that only research generates more research, so it is important in this case to note these domains as relevant and link them with practises in other social spheres.

Note

1. The research on maintenance activities is being carried out in the context of a project in progress entitled *Creation and Maintenance Activities of Social Life and Gender* (IM 75/97). This project is being undertaken by a group of Spanish women scholars from different disciplines within the Social Sciences. The group of archaeologists is composed by Esther Hachuel, Laia Colomer, Marina Picazo, Paloma G. Marcén and Sandra Montón.

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